Jet Propulsion Laboratory
California Institute of Technology

AIRS Outreach

Science Team Meeting Oct 2008 - Sharon Ray

AMS New Orleans
Climate Day Los Angeles
JPL Open House

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California Institute of Technology

The New AIRS Web Site

Launched 9/29/08

Check out the new AIRS web site at *airs.jpl.nasa.gov*

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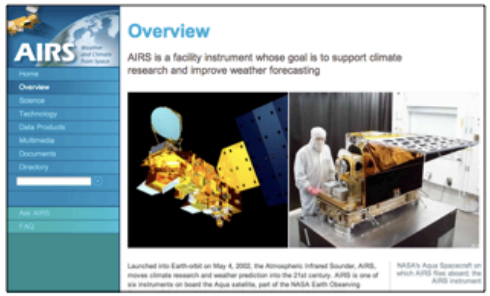
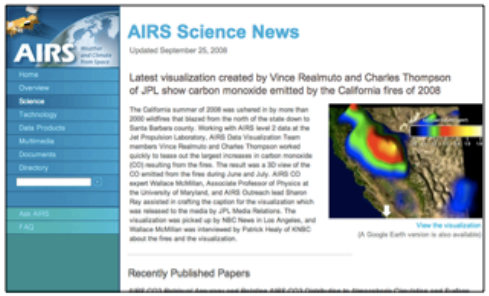
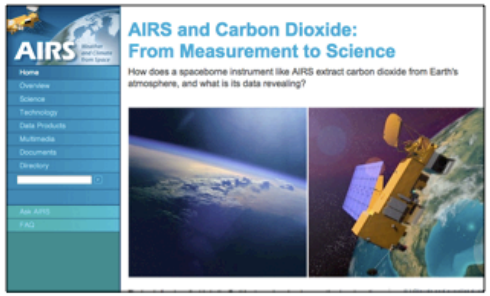
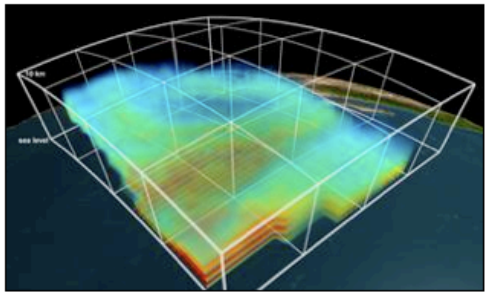
The New AIRS Web Site

News, data, animations, information — The Atmospheric Infrared Sounder on NASA's Aqua satellite is making a difference in the science of Earth's weather and climate









"The AIRS instrument has provided the most significant increase in forecast improvement in this time range of any other single instrument."

- Vice Admiral Conrad C. Lautenbacher, US Navy (Ret.), NOAA Administrator

"The [weather] forecast improvement accomplishment alone makes the AIRS project well worth the American taxpayers investment"

- Dr. Mary Cleave, associate administrator of NASA s Science Mission Directorate

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The New AIRS Web Site

• Serving the Public & the Science Communities
- Overviews, Stories, Maps, Rapid Reponse, Multimedia
- Major Findings, Papers, Extensive Data Information, AskAIRS, FAQ

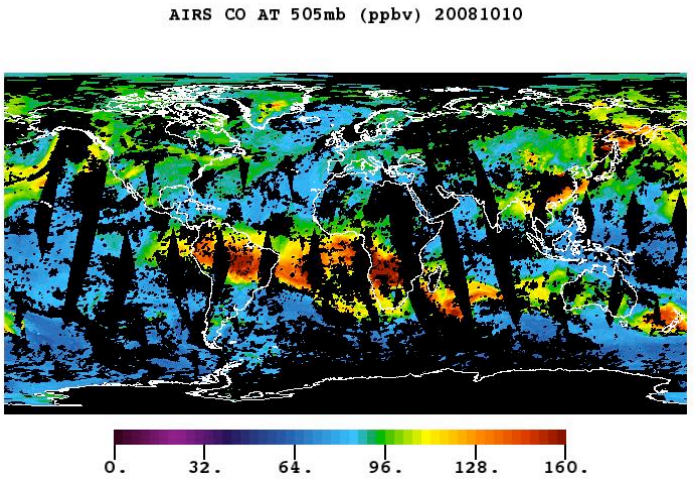
• New Organization
- Easy access
- Get imagery the way you want it. Organized by:
geophysical data product, natural hazard, visualizations, animations, video

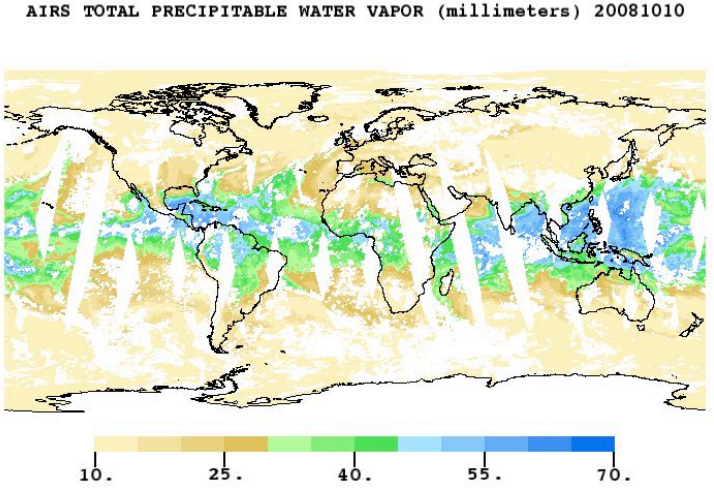
• New Look
- Lots of visuals with links to NASA databases

• New Features
- Maps In Motion: archive of the “pretty version” of 10 data products from the beginning of the mission
- Maps from Satellite Feed coming soon: daily images of 6 data products. Image is zeroed out at night, builds up during the day as granules come in
- Science News
- FAQ
- Publications Database

• Efficient Image Archive Strategy

• Fast updates
- iWeb development environment





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The New AIRS Web Site
More content please

- Papers
  - Publications Database
  - possible web feature (home page headline)
- Feature stories
  - Home page headline
  - Could feed to the Global Climate Change web site
- Science News
  - informal, to highlight an image, field campaign, anything
  - latest papers
- Video
  - build up our scientist interviews gallery
- Multimedia Gallery
  - add your image/movie/plot

Teasing out Carbon Dioxide From Earth's Atmosphere: An interview with Cyril Crevoisier

Cyril Crevoisier of France's National Center for Scientific Research talks about the challenges of retrieving atmospheric CO2 and his effort to find its sources and sinks

My name is Cyril Crevoisier. I was formerly a Ph.D. student in Paris at the Laboratoire de Météorologie Dynamique working with Alan Chedin, and we were working on CO2 retrievals from AIRS observations. Since October 2004 I've been doing a post-doc at Princeton University, estimating carbon sources and sinks at Earth's surface.

I'm now working with Alan Chedin and Noelle Scott of the Laboratoire de Météorologie Dynamique. They have been involved in using satellite observations for about 20 or 30 years now and so have very good knowledge of all these instruments. They began looking at TOVS [data for] observations of CO2. The TOVS instruments were first launched in 1972 and are still operating now, but they have very small spectral resolution which means we cannot really extract all the information about different species – CO2, methane, etc. Whereas with AIRS, the spectral resolution has really increased so we have a lot more information about CO2.

Dr. Cyril Crevoisier

Cyril Corvouisier
Andrew Dessler
Larrabee Strow
Mitch Goldberg
Walter Wolff

David Neilan
Chris Barnet
Mous Chahine
Andrew Gettleman
Laura Pan

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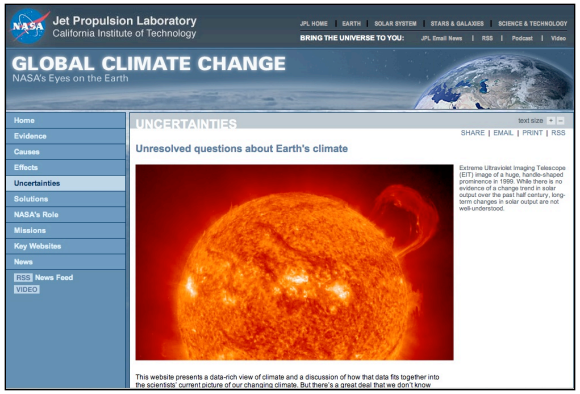
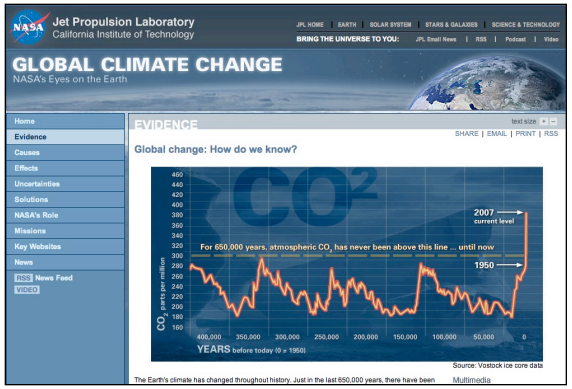
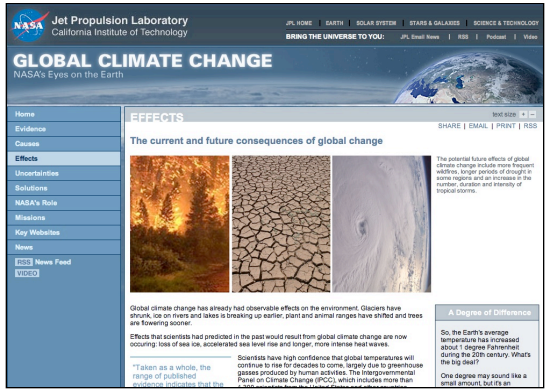
Global Climate Change Web Site

Launched June 15, 2008

- 1.2 million hits/99,000 page views in first two weeks
- Already a top 10 Google search result for 'Global Climate Change'
- Earth Vital Signs Widget: Number 9 out of over 3,700 widgets on Apple.com
- Solid following on Twitter







http://climate.jpl.nasa.gov

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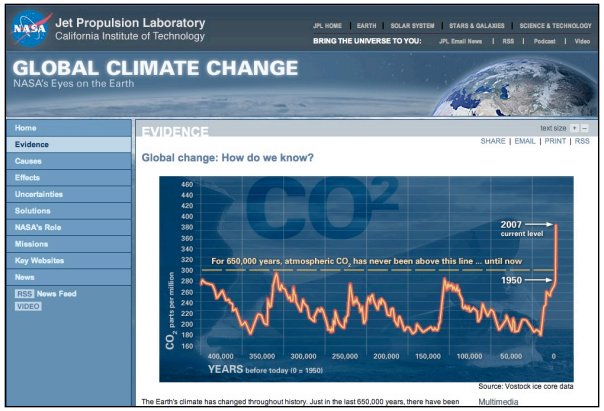
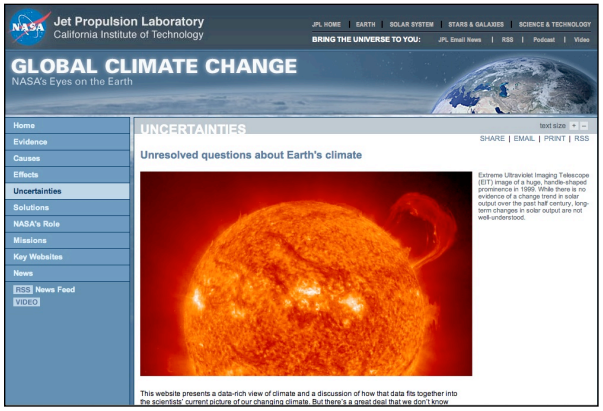
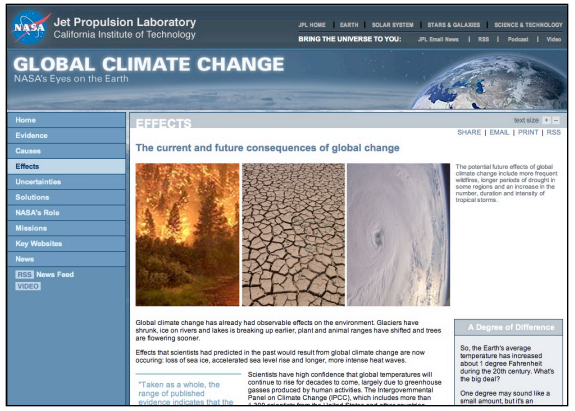
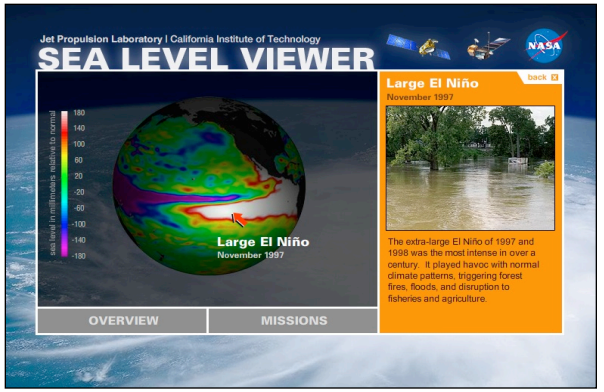
A Focus on Visual Elements

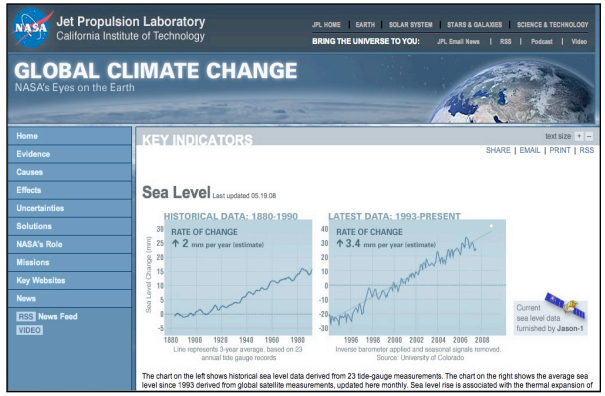
News…key climate change indicators…interactives…
videos…NASA's role in climate science research

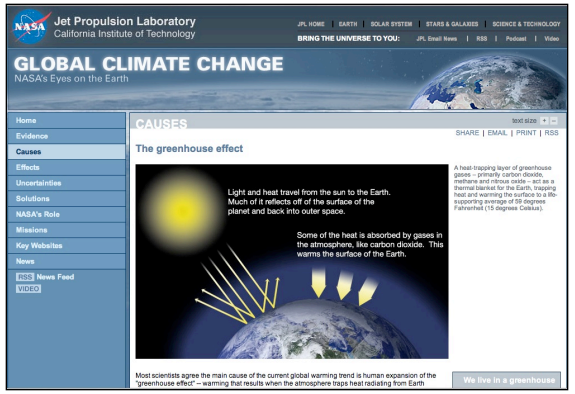












http://climate.jpl.nasa.gov

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Strong Reviews from Media, Web Pundits, and Users

Dozens of articles; 300+ blog postings

I plan to have it a classroom staple.
–J.R.Waring, Earth science teacher

The “Climate Time Machine”…. will knock your socks off.
–Greg Laden, Science and Engineers for America

Reaching into the Web 2.0 World

A solid following on Twitter

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Target Outlets

• The Web
- AIRS, Global Climate Change, JPL Home, Earth Observatory, NASA Home, NASA Earth
- Discovery EarthLive, Google Earth
- Wikipedia

• Print
- Weatherwise

• Radio

• Broadcast
- Event-driven visualizations for News outlets
- CO visualization on KNBC
- AIRS hurricane image on Fox News

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News Release:
NASA Maps Shed Insights Into Its Global Nature

- *Issued October 9*

Chahine, M. T., L. Chen, P. Dimotakis, X. Jiang, Q. Li, E. T. Olsen, T. Pagano, J. Randerson, and Y. L. Yung (2008), **Satellite remote sounding of mid-tropospheric CO2**, Geophys. Res. Lett., 35, L17807, http://dx.doi.org/10.1029/2008GL035022 9 September 2008

October 09, 2008PASADENA, Calif.

- A NASA/university team has published the first global satellite maps of the key greenhouse gas carbon dioxide in Earth's mid-troposphere, an area about 8 kilometers, or 5 miles, above Earth. The team's study reveals new information on how carbon dioxide, which directly contributes to climate change, is distributed in Earth's atmosphere and moves around our world.

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Web Stats

September 2008

3,644 visits came from 105 countries/territories

Detail Level: City | Country/Territory | Sub Continent Region | Continent Dimension: None

Site Usage | Goal Conversion

Visits	Pages/Visit	Avg. T
3,644	3.20	00:0
% of Site Total: 100.00%	Site Avg: 3.20 (0.00%)	Site Av

Detail Level: Country/Territory

1.	United States
2.	United Kingdom
3.	Japan
4.	Canada
5.	India
6.	Germany
7.	Australia
8.	France
9.	China
10.	Mexico

3,644 Visits

2,975 Absolute Unique Visitors

11,668 Pageviews

3.20 Average Pageviews

00:02:22 Time on Site

52.09% Bounce Rate

78.13% New Visits

Page	
1.	/
2.	/Data/
3.	/Data/DailyMaps/
4.	/News/Events/
5.	/Products/
6.	/WeatherSnapshots/HurricaneGustav/H
7.	/Data/GetAIRSdata/
8.	/Science/
9.	/Products/CarbonDioxide/
10.	/Mission/

Visits **3,644** (% of Site Total: 100.00%) Pages **3.20** (Site Av)

Source/Medium	
1.	google / organic
2.	(direct) / (none)
3.	yahoo / organic
4.	search.nasa.gov / referral
5.	climate.jpl.nasa.gov / referral
6.	search.jpl.nasa.gov:8080 / referral
7.	photojournal.jpl.nasa.gov / referral
8.	jpl.nasa.gov / referral
9.	images.google.com / referral
10.	nasa.gov / referral

October 1-12, 2008

Visits **7,672**
% of Site Total: 100.00%

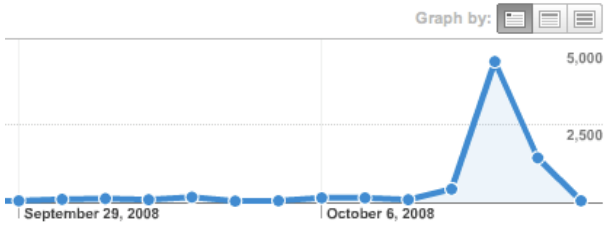
Detail Level: Country/Territory

1.	Italy
2.	United States
3.	United Kingdom
4.	Germany
5.	France
6.	Canada
7.	Switzerland
8.	Spain
9.	Japan
10.	Netherlands

- *News Release Issued October 9*

Sep 1, 2008 - Oct 12, 2008

Graph by:



7,672 Visits

7,122 Absolute Unique Visitors

14,067 Pageviews

1.83 Average Pageviews

00:01:11 Time on Site

72.73% Bounce Rate

90.92% New Visits

Page	
1.	/story_archive/Measuring_CO2_from_Space/
2.	/
3.	/meetings/science-team-greenbelt/
4.	/maps/maps_in_motion/
5.	/overview/overview/
6.	/science/news/
7.	/multimedia/geophysical_products_multimedia/carbon_dioxide/
8.	/data_products/data_product_descriptions/
9.	/story_archive/Measuring_CO2_from_Space/Measurement_to_Science/
10.	/multimedia/geophysical_products_multimedia/

Sources
corriere.it (referral)
(direct) ((none))
google (organic)
climate.jpl.nasa.gov (referral)
nasa.gov (referral)

Web Stats

As of October 12

• Google Search Terms
- carbon dioxide: 19th
- carbon dioxide map: 4th; 3 of the first 10
- carbon dioxide map - images: 7th, 9th of 449k results

• Yahoo Search Terms
- carbon dioxide: -
- carbon dioxide map: 3rd, 4th of 16.5 million results
- carbon dioxide map - images: 24th of 504 results

• Cited on 184 blogs

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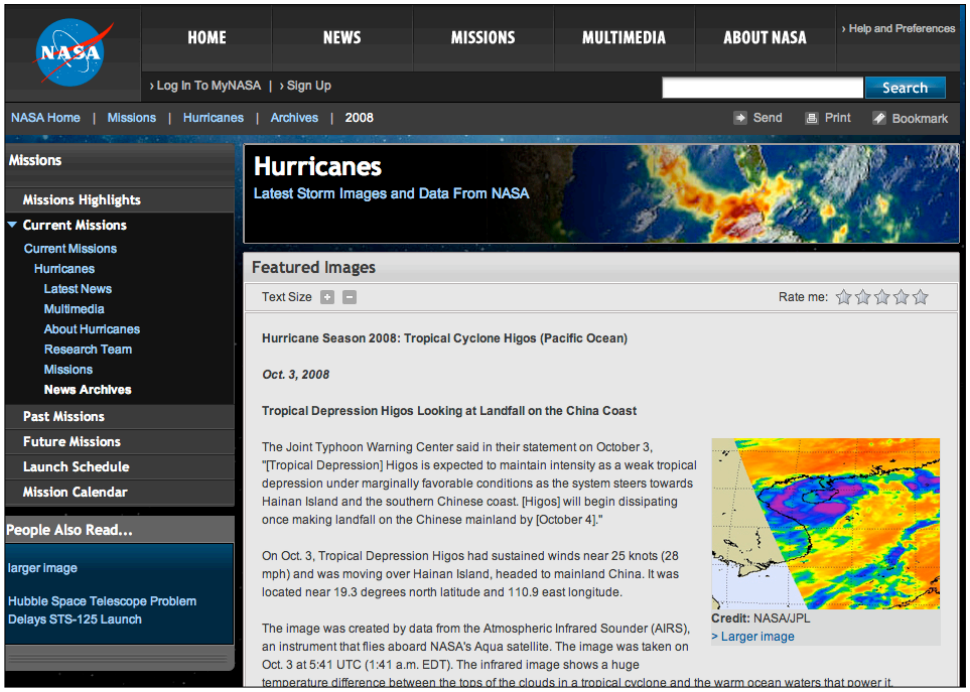
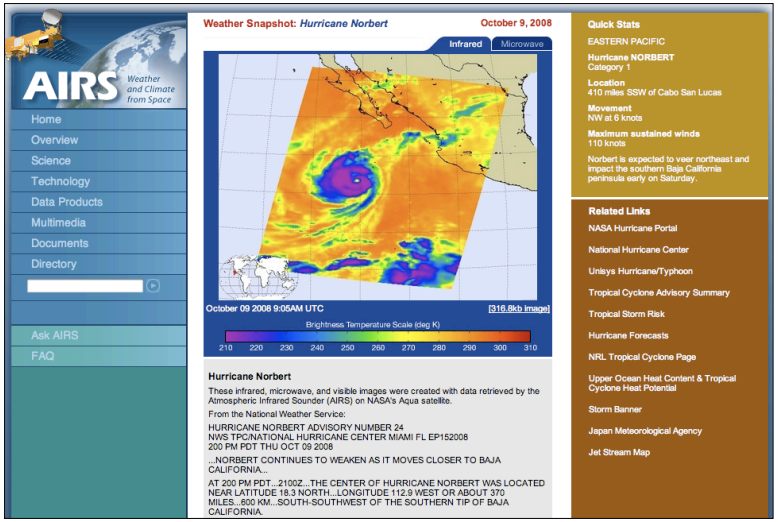
Hurricane Rapid Response

• AIRS supplied 41 of the 60 images used by the NASA Hurricane portal so far during the 2008 Hurricane Season

• NASA Hurricane Page - almost half a million visitors in September

- The NASA Hurricane page pulled in 495,979 hits in the month of September (per Rob Garner, NASA Goddard web master)





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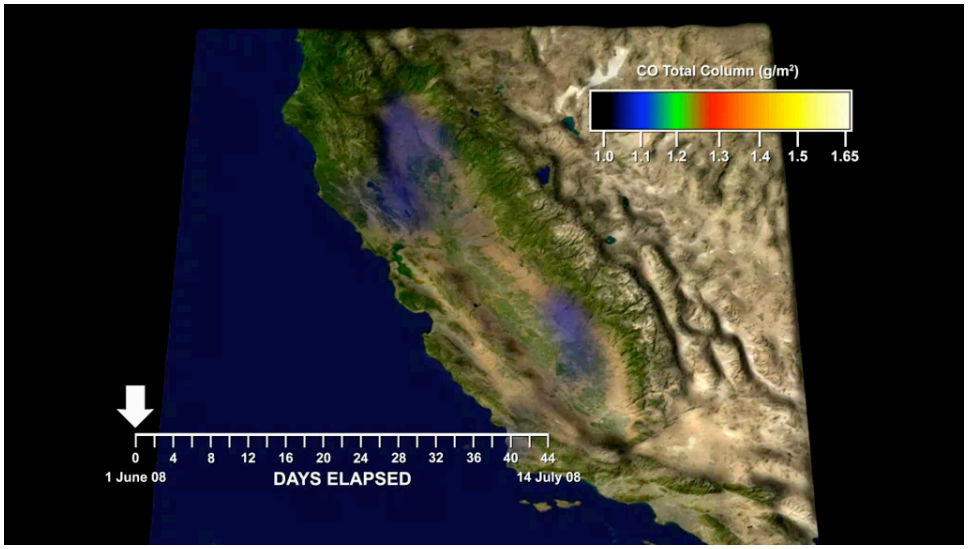
New Visualization



Carbon Monoxide from California's Wildfires

Visualization of the rapid increases in carbon monoxide (CO) emitted by fires burning in California in June and July 2008. Only the largest values of CO detected by AIRS are shown to highlight the impact of the fires. AIRS primarily observes CO in a layer from 2 to 7 kilometers above Earth's surface. Thus, it tends to see where the wind blows the carbon monoxide and not just the smoke directly above the fires. However, many of these intense fires lofted a significant amount of carbon monoxide directly above the fires, making the hotspots also visible to AIRS.

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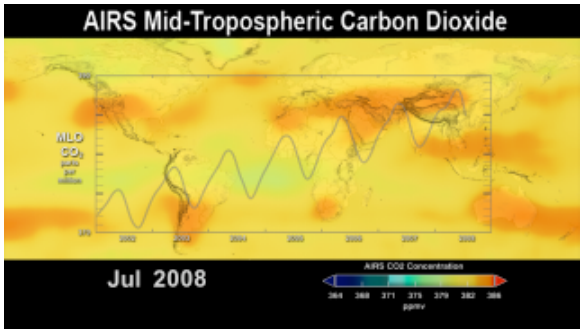
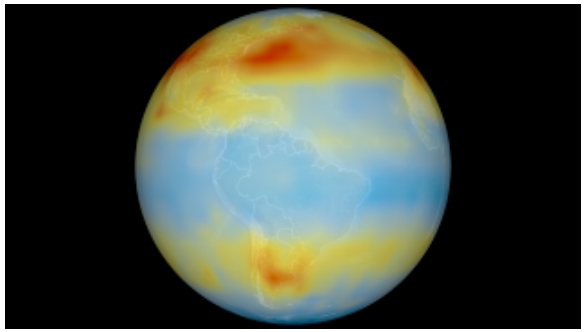
New Visualization



CO2 with Mauna Loa Data Overlaid



AIRS Sees Belt of CO2 in Southern Hemisphere, July 2003

- Created by Lori Perkins, GSFC SVS

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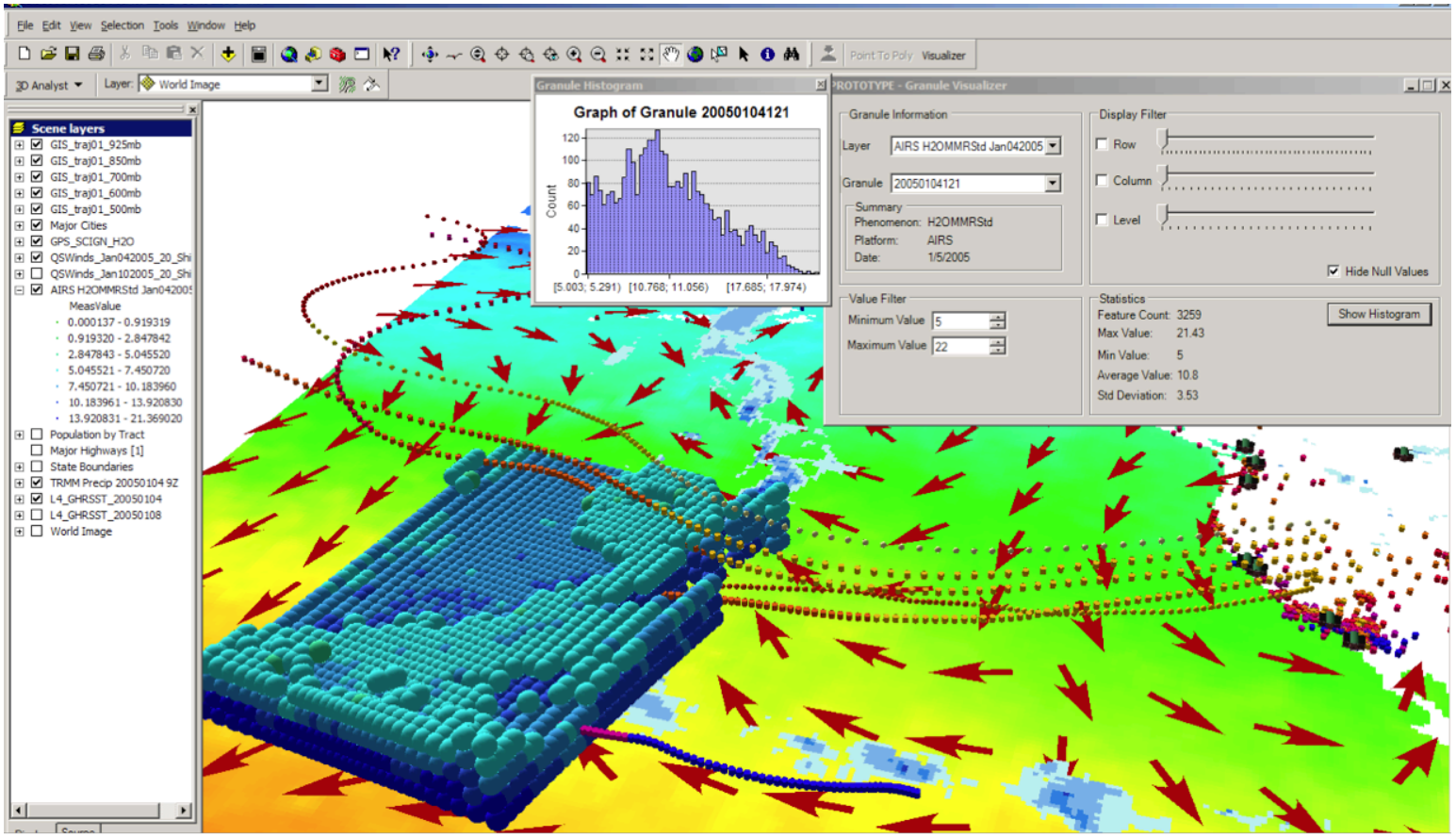
New Visualization



Three-Dimensional View Of Water Vapor Transport Along A Pacific Basin Atmospheric River, January 4, 2005

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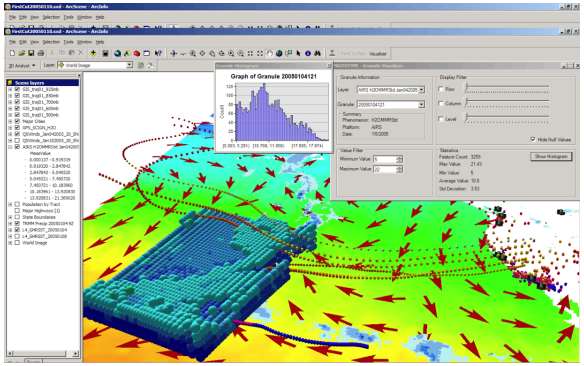
New Visualization



Three-Dimensional View Of Water Vapor Transport Along A Pacific Basin Atmospheric River, January 4, 2005

The development of a plug-in prototype GIS tool had, as a science driver, a case study examining the role of water vapor transport along an atmospheric river across the Pacific Basin in January 2005. During this time period an extreme precipitation event was produced. This event caused significant amounts of rain to fall over much of California, triggering mudslides that resulted in millions of dollars of damage and a dozen deaths.

The study characterized the three-dimensional distribution of water vapor during the event and related surface winds and height-resolved water vapor to coastal rainfall. Measurements were supplied by a host of spaceborne instruments and one ground-based instruments. These measurements consisted of: water vapor from the AIRS instrument, surface winds from QuikSCAT, precipitation from TRMM, sea surface temperature from GHRSST, and integrated water vapor from SCIGN ground-based GPS. Back-in-time trajectories were provided by HYSPLIT.

In this figure, a granule of AIRS water vapor data was subsetted to show the points with highest values of water vapor in the northeastern Pacific. These measurements are shown as a point cloud superimposed on a background of GHRSST sea surface temperatures, TRMM precipitation, and QuikSCAT wind vectors.

To the right of the image, water vapor amounts from the SCIGN GPS network are shown color-coded by absolute magnitude for various stations. Back trajectories from the NOAA HYSPLIT model are shown as dotted lines, indicating the relationship between the atmospheric water vapor over the Pacific and water vapor over land. A histogram of the AIRS data values is also shown in the top center of the image.

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Carbon Markets Insights Conference

"Point Carbon is a world-leading provider of independent news, analysis and consulting services for European and global power, gas and carbon markets."

"...the number one supplier of unrivaled market intelligence of these markets."

"Our staff includes experts in international and regional climate policy, mathematical and economic modeling, forecasting methodologies, risk management and market reporting."

• New Audience
- Congressional staffers, venture capitalists, policy makers

• Objective
- Convey that JPL is a leader in the remote sensing of CO2
- unbiased, global data that is free
- introduce existing data (AIRS) and new missions (OCO & Ascends)

• AIRS & OCO presence, booth
- Staffed by Tom Pagano & Sharon Ray (AIRS), Stacey Boland OCO

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Book: Atmospheric Science at NASA - A History

• Chronicles the history of atmospheric science at NASA

-traces the story from its beginnings in 1958, the International Geophysical Year, through to the present, focusing on NASA's programs and research in meteorology, stratospheric ozone depletion, and planetary climates and global warming. But the story is not only a scientific one.

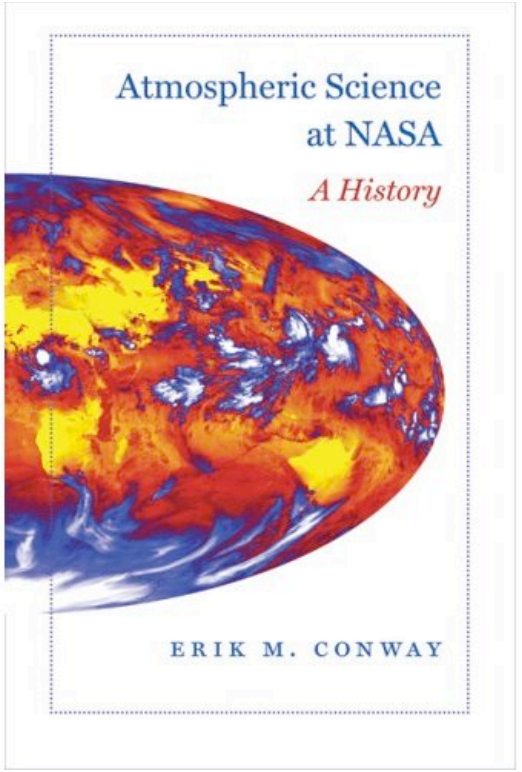
- NASA's researchers operated within an often politically contentious environment. Although environmental issues garnered strong public and political support in the 1970s, the following decades saw increased opposition to environmentalism as a threat to free market capitalism.

• Critically examines this politically controversial science

- Dissects the often convoluted roles, motives, and relationships of the various institutional actors involved -- among them NASA, congressional appropriation committees, government weather and climate bureaus, and the military.

"The author does an excellent job of telling this story -- translating the science into prose, characterizing the various personalities and institutions, organizing the convoluted tale into a narrative, and assessing interactions of multifarious factors. The work... will stand as a significant contribution to the literature. Much of the story has not yet been told, or if it has, certainly not in this detail or scope. It is likely to rank high in the top score or so of books devoted to the history of space science."

-- Joseph N. Tatarewicz, University of Maryland, Baltimore County



Johns Hopkins University Press
http://www.press.jhu.edu/books/title_pages/9567.html